

# ZX Spectrum Software

NEW TITLES BEING ADDED CONSTANTLY

## ON CASSETTE



## ROM CARTRIDGE



**LEARN TO READ 5**  
Learning is fun with one of five comprehensive programmes designed to teach your child to read.

**ALPHABET GAMES**  
The sixth programme in the series dealing with letter recognition, punctuation and spelling at an elementary level. Lots of fun!

**PLANET OF DEATH**  
All the magic of Tolkien in one of the most advanced micro games available.



**VU-3D**  
Create your own 3D, fully rotating picture with magnification and reduction facility. High resolution colour graphics.

**GAMES I**  
Backtrack, Marbles, Knockout, Snakes and Labyrinths. Four great games on one cassette.

**THE HOBBIT**  
All the magic of Tolkien in one of the most advanced micro games available.



**SMALL BUSINESS ACCOUNTS**  
Balance sheets, Profit and Loss information, Sales Tax and many other helpful facilities.

**VU-FILE**  
Link accounts, files, dates or addresses to give you a geographical information service.

**CLUB RECORD CONTROLLED**  
Will hold 350 records containing names, addresses and nine other file references vital to club members.



**PLANETOIDS**  
Test your skills against alien bombers as you defend the galaxy of Planetoids.

**SPACE RAIDERS**  
Defend Earth from certain destruction at the hands of the Space Raiders.

**HUNGRY HORACE**  
Horace eats anything. Patras, flowers, even lunch. Can you keep him out of trouble?



**COOKIE**  
Help Charlie keep the evil forces of the evil forces out of the bowl. Fun for all.

**JET PAC**  
You'll have to be quick on your toes. Fast and action packed space travel.

**BACKGAMMON**  
Choose your own skill level. A quality, full colour programme, complete with rules.



**CHIESS**  
Whether you're a master or just learning, this sophisticated, full colour programme is a must.

**ZAXXON**  
Space age racing with multi-directional movement and graphic features.

**ZAXXON II**  
Space age racing with multi-directional movement and graphic features.

**Dimensions**  
Width 233 mm  
Depth 144 mm  
Height 30 mm

**CPU memory**  
Z80A microprocessor running at 3.5 MHz.  
16K-byte ROM containing BASIC interpreter and operating system.  
16K-byte RAM (plus optional 32K-byte RAM on internal expansion board) or 48K-byte RAM.

**Keyboard**  
82-moving-key keyboard with full upper and lower case with capital lock feature. All BASIC words obtained by single keys, plus 16 graphics characters, 22 colour control codes, and 21 user-definable graphics characters. All keys have auto repeat.

**Display**  
Memory-mapped display of 256 pixels x 192 pixels. Each pixel attributes 4 bits per character square, defining one of eight foreground colours, one of eight background colours, normal or extra brightness and flashing or steady. Screen border colour also settable to one of eight colours. Will drive PAL, LHF colour TV set, or black and white set which will give a scale of grey, on channel 36.

**Sound**  
Internal loudspeaker can be operated over more than 10 octaves (actually 130 semitones) via basic DEEP command. Jack sockets at the rear of computer allow connections to external amplifier/speaker.

**Graphics**  
Point, line, circle and arc drawing commands in high-resolution graphics.  
16 pre-defined graphics characters plus 21 user-definable graphics characters. Also functions to select character at a given position, attribute at a given position (colours, brightness and flash) and when given a given pixel is set. Text may be written on the screen on 24 lines of 32 characters. Text and graphics may be freely mixed.

**Colours**  
Foreground and background colours, brightness and flashing are set by BASIC INK, PAPER, SPEED and FLASH commands. OVER may also be set, which performs an exclusive-or operation to overwrite any printing or plotting that is already on the screen. INVERSE will give inverse video printing. These six commands may be set globally to cover all further PRINT, PLOT, DRAW or CIRCLE commands, or locally within these commands to cover only the results of that command. They may also be set locally to cover text printed by an INPUT statement. Colour control codes, which may be accessed from the keyboard, and when displayed will overwrite the globally set colours until another colour code is encountered. Brightness and flashing codes may be inserted into program or text, similarly. Colour control codes in a program listing have no effect on its execution. Border colour is set by a BORDER command. The eight colours available are black, blue, red,

magenta, green, cyan, yellow and white. All eight colours may be present on the screen at once, with some areas flashing and others steady and any area may be highlighted extra bright.

**System**  
The screen is divided into two sections. The top section - normally the first 22 lines - displays the program or the results of program command execution. The bottom section - normally the last 2 lines - shows the command or program line currently being edited. It also shows the report messages. Full editing facilities of cursor left, cursor right, insert and delete with auto-repeat facility are available over this line. The bottom section will expand to accept a current line of up to 22 lines.

**Mathematical operations and functions**  
Arithmetic operations of +, -, \*, /, =, and raise to a power. Mathematical functions of sine, cosine, tangent and their inverses, natural logs and exponentials, sign function, absolute value function, and integer function, square root function, random number generator, and pi. Numbers are stored as five bytes of floating point binary - giving a range of  $\pm 3 \times 10^{19}$  to  $\pm 7 \times 10^{-17}$  accurate to 9.7 decimal digits. Binary numbers may be entered directly with the BINARY function = < >, < > and < > may be used to compare string or arithmetic values or variables to yield 0 (false) or 1 (true). Logical operators AND, OR and NOT yield boolean results but will accept 0 (false) and any number (true). User-definable functions are defined using DEF FN, and called using FN. They may take up to 26 numeric and 26 string arguments, and may yield string or numeric results.

There is no fixed DATA structure, using the commands READ, DATA and RESTORE. A real-time clock is obtainable.

**String operations and functions**  
Strings can be concatenated with +. String variables or values may be compared with =, <, >, <=, >= to give boolean results. String functions are LEN, VAL, STR\$, and LEN, CHR\$, and CODE convert numbers to characters and vice versa, using the ASCII code. A very powerful string slicing mechanism exists, using the form \$\$(X TO Y).

**Variable names**  
Numeric - may be concatenated with a letter upper and lower case are not distinguished and no trailing spaces are ignored. String - AS to ZS. FOR-NEXT loops - A-Z. Numeric arrays - A-Z. String arrays - AS to ZS. Simple variables and arrays with the same name are allowed and distinguished between.

**Arrays**  
Arrays may be multi-dimensional, with subscripts starting at 1. String arrays, technically character arrays, may have their last subscripts omitted, yielding a string.

**Expression evaluator**  
A full expression evaluator is called during program execution whenever an expression, constant or variable is encountered. This allows the use of expressions as arguments to GOTO, GOSUB, etc.  
It also operates on commands allowing the ZX Spectrum to operate as a calculator.

**Cassette interface**  
The ZX Spectrum incorporates an advanced cassette interface. A tone leader is recorded before the information to overcome the automatic recording level fluctuations of some tape recorders, and a Schmitt trigger is used to remove noise on playback.

All saved information is started with a header containing information as to its type, file, length and address information. Program, screens, blocks of memory, string and character arrays may all be saved separately. Programs, blocks of memory and arrays may be verified after saving to confirm successful saving. Programs and arrays may be merged from tape to combine them with the existing contents of memory where two line numbers or variables names coincide. The old one is overwritten. Programs may be saved with a line number where execution will start immediately on loading. The cassette interface runs at 1500 baud, through two 3.5 mm jack plugs.

**Expansion port**  
This has the full data, address and control buses from the Z80A, and is used to interface to the ZX Printer, the RS232 and NMT interfaces and the ZX Microdrive.

IN and OUT commands give the I/O port equivalents of INPC and OUTPC.

**Z80 compatibility**  
Z80 BASIC is essentially a subset of ZX Spectrum BASIC. The differences are as follows:

FAST and SLOW: The ZX Spectrum operates at the speed of the ZX81 or ZX82 mode with the steady display of SLOW mode, and does not include these commands.

SCROLL: The ZX Spectrum scrolls automatically, saving the operator "scroll" every time a screen is full.

UNPLOT: The ZX Spectrum can unplot a pixel using PLOT OVER, and thus achieves unplot. Character set: The ZX Spectrum uses the ASCII character set, as opposed to the Z80 non-standard set.

Z80 programs may be typed into the ZX Spectrum with very little change, but may of course now be considerably improved. The ZX Spectrum is fully compatible with the ZX Printer, which can now print out a full upper and lower case character set, and the high resolution graphics, using LIST, UNPRINT and COPY.

Z80 software cassettes and the ZX 16K RAM will not operate with the ZX Spectrum.



ZX MICRODRIVE



ZX INTERFACE 1

ZX INTERFACE 2

**THE FINAL TOUCH**  
You've never given your ZX Spectrum investment... You have in your hands a superb machine that represents not only the very latest in micro-computer technology, but also the key to a well-informed and educated child who will provide you and your family with the ability to cope with the advances of technology tomorrow.



DAVID REID ELECTRONICS LIMITED  
P.O. Box 2630, Auckland, New Zealand.

PROFESSIONAL PERFORMANCE,  
MORE CAPACITY...  
HOME COMPUTER PRICE TAG!

- \* Superb educator \* Brilliant entertainer
- \* Very latest technology \* Valuable business tool
- \* Easy to use \* 16K and 48K models
- \* Sound investment \* Fully expandable system
- \* Compact and totally versatile

## ZX SPECTRUM The home computer for every family

Why do you need a home computer? Quite simply, because the computer is too important to be misunderstood. Computers are part of our everyday life — we see them on television, we see them in action at work, they even send us bills... but don't be pleased out by them — basically, they're VERY FRIENDLY!

This brochure will give you a feel for the Sinclair ZX Spectrum and for the excitement and satisfaction of understanding the most important machine of the twentieth century!

Many computers are designed specifically for business, some are mere games machines... but the ZX Spectrum is a true all-rounder! It's a superb educator. A brilliant entertainer and a competent business machine.

## ZX SPECTRUM begins a new era in education and entertainment!

For kids, Spectrum is a sophisticated yet simple to use learning tool! Traditional forms of education can get dull — ZX Spectrum changes all that!

Specially devised programs turn chores like spelling and punctuation into loads of learning fun.

It's surprising how quickly and painlessly their vocabulary grows! If the only way they can save the beautiful princess from the beast is by spelling 10 words correctly!

## SPECTRUM instructs while it entertains!

Spectrum instructs visually and systematically and the information can be replayed as often as required to any number of children! PLUS! There's more educational software available for the ZX Spectrum than any other home computer (a sample of the Sinclair Software available is shown in this brochure).

## Long term potential!

How far you go with the Spectrum is up to you because ZX Spectrum is just the heart of a fully expandable system which you can build in easy, logical steps.

You can buy a Spectrum with the assurance that it is not about to be superseded — certainly not by Sinclair, probably not by any other computer for a long time to come!

## Two Manuals!

ZX Spectrum comes with everything you need to get started right away, including two instruction manuals. If you're new to home computing, you'll find both manuals of immense help. Together, they represent a complete course in BASIC programming. If you already have some experience of computers, you can skip much of the groundwork and move straight into the colourful world of ZX Spectrum professional-level computing.



**ZX INTERFACE 2** — enables you to use the New ZX ROM Cartridges (instant load programs) and 2 joysticks for extra fun — just plug in and play. You simply connect Interface 2 to the back of the Spectrum, plug in the ZX ROM Cartridge of your choice, add a pair of joysticks and the fun and games will really start!

**ZX INTERFACE 1** — the unique 'add-on' unit is the heart of the Spectrum Networking System which enables up to 64 Spectrums to be linked together and operated at the same time. Imagine 64 Spectrums all going at once! Ideal for schools, competitions or group activities... offers tremendous entertainment possibilities. This multi-purpose unit also controls up to 8 Microdrives and has a special facility that allows ZX Spectrum to operate full size printers, terminals and modems.

**ZX MICRODRIVE** — microdrives give you lightning access to massive amounts of data and information on Microdrive Cartridges. With all the advantages of 'floppy disk' storage at just a fraction of the cost, each Microdrive Cartridge offers at least 65K bytes capacity. IT'S FAST! A typical 48K program which would take several minutes to load from cassette can be loaded in a matter of just 9 seconds.

## Colour and sound!

ZX Spectrum gives you superb, high resolution graphics, full colour (6 colours each for foreground, background and border) and a built-in sound generator — great for creating your own sound effects and composing music!

## Easy to use!

The full size, moving key keyboard is a breeze to use (ideal for every member of the family) and incorporates established Sinclair features such as 'one-touch' keyword entry, repeat facility on all keys and syntax error checking for faster programming.

## Use your own cassette recorder!

Spectrum comes with all the necessary leads you need to connect both TV and cassette recorder. No need to buy a special data recorder! Any good quality domestic cassette recorder can be used to store and retrieve programs.

## Massive Memory!

ZX Spectrum is available in 16K and 48K models. Powerful memory functions allow you to create more complex programs... play more sophisticated games!

## Ultra Compact!

Spectrum is amazingly compact... the whole ZX System (which includes Microdrive, interfaces and joysticks) will fit into the average size briefcase!

## It's convenient... so easy to set up and operate!

With the lead supplied ZX Spectrum plugs directly into your TV set at home (colour or black and white) to give a big, bright, beautiful display that's steady as a rock.